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Case report

Expandable metal stents in chronic pancreatitis

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Background

Biliary obstruction in chronic pancreatitis may be relieved by the insertion of a biliary endoprosthesis. Stenting is usually achieved with a plastic device, but self-expandable metal stents may also be used.

Case outlines

Two patients are described with severe chronic pancreatitis complicated by biliary obstruction and portal vein thrombosis, who underwent insertion of metallic biliary endoprostheses. In both patients the endoprostheses became occluded, at 12 and 7 months respectively, which necessitated open operation. Both patients experienced surgical complications and one patient died postoperatively.

Discussion

The use of metal endoprostheses in chronic pancreatitis may result in occlusion, necessitating open operation. Such stents should be used with caution in these patients, who are likely to be high-risk surgical candidates.

Keywords

metal stent, chronic pancreatitis, complications

Introduction

Cholestasis caused by stenosis in the intrapancreatic segment of the common bile duct occurs in 10–20% of patients with chronic pancreatitis (CP) [1]. Persistent biliary obstruction may lead to recurrent cholangitis in about 9% and to secondary biliary cirrhosis in about 7% of patients [2]. Pyogenic liver abscess may also occur [3]. Biliary drainage is frequently indicated [4] and until 1980 surgical biliary-enteric bypass was the mainstay of treatment [5]. However, operation is associated with a considerable morbidity rate (15–30% wound infection, biliary leak, haematoma) and mortality rate (0–7%) [6]. Endoscopic techniques of balloon dilatation and stenting have emerged as an alternative approach, initial procedure-related morbidity and mortality rates being low after stent insertion [1, 7]. Long-term results of stenting with plastic endoprostheses reveal three main complications: occlusion (20–30% of patients over 6–18 months) [8] and, to a lesser extent, stent migration (6–33%) [9] and passage of the stent [10]. The use of metal stents (balloon or self-expandable) has been suggested, but experience is limited [7, 11]. Two cases of recurrent biliary obstruction following metal stent insertion for CP are presented, with a review of the limited published experience and a discussion of their role in the treatment of this condition.

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Case reports

Case no. 1

A woman suffered from alcohol-induced chronic pancreatitis (CP) from the age of 27 years. She initially underwent laparotomy and drainage of ascitic fluid, when an indurated pancreas was noted. She developed insulin-dependent diabetes mellitus (IDDM) and was managed as an outpatient. At the age of 42 years, she became intermittently jaundiced with a serum bilirubin of 180 μmol/L (<20 μmol/L) and alkaline phosphatase of 1496 IU/L (25–100 U/L). Alcoholic liver disease and secondary biliary cirrhosis were diagnosed. ERCP showed a tapering common bile duct (CBD) stricture typical of CP. Computed tomography (CT) revealed diffuse pancreatic calcification, portal vein thrombosis and collateral veins around the porta hepatis. Operation was not considered because of the collateral veins and chronic chest disease secondary to her excessive smoking (40 cigarettes per day).

Three years later after repeated episodes of jaundice and cholangitis, a balloon-expandable metal stent (Strecker-Stent BSIC Co., Hilden, Germany) was inserted across the biliary stricture. No plastic stent had been used previously. One year later this metal stent blocked; a 10 F plastic stent was successfully inserted

through it. Two years later the new stent also blocked and could not be removed, having migrated proximally. Another 10 F stent was inserted in parallel. Ten days later a further blockage occurred; the second stent was removed, and an internal/external drain was introduced. At this stage she was transferred to our hepato-pancreato-biliary surgical unit. She was jaundiced with a serum albumin of 20 g/L (35–50 g/L). After much deliberation a decision was made to attempt a surgical drainage procedure. At operation she was noted to have profound portal hypertension and therefore limited hilar dissection was possible. A side-side Roux-en-Y choledochojejunostomy and cholecystectomy were carried out. Following operation the patient was initially well, but on day 4 she developed severe respiratory problems and required assisted ventilation. Ascites was drained and albumin replaced. Ten days later melaena was noted and oesophageal varices were injected. A further massive GI bleed ensued and she died of a cardiac arrest.

Case no. 2

A male patient developed alcohol-induced CP at the age of 53 years. One year later he underwent distal pancreatectomy, splenectomy and lateral pancreaticojejunostomy. Biliary obstruction occurred at the age of 60 years and over the next 3 years he had repeated plastic stents inserted endoscopically across the CBD stricture. A decision was made to use a more permanent device, and at the age of 63 years a self-expandable Wallstent (Schneider/Pfizer, Buelach, Switzerland) was inserted percutaneously. Three months before insertion of the metal stent, CT scan had shown thrombosis of the main left portal vein with formation of numerous collateral veins around the porta hepatis (Figure 1). Seven months later this stent blocked, and a plastic stent was inserted through it percutaneously. This stent blocked 3 months later and, after failure to insert another stent endoscopically, an internal/external drain was passed percutaneously. This manoeuvre was followed by dilatation of the metal stent and percutaneous insertion of a plastic stent. Because of recurrent episodes of biliary obstruction, operation was considered a more appropriate method of management. Because of portal hypertension only limited hilar dissection was done and a side-side Roux-en-Y choledochojejunostomy and cholecystectomy were carried out.

Postoperative management was complicated with pneumonia and septicaemia but he recovered well and went home 15 days after operation. The patient remains well on follow-up at 42 months while taking insulin and pancreatic enzyme supplements.

Discussion

The use of endoscopically placed metal stents in the treatment of malignant biliary obstruction is well established. Comparative studies have shown the superiority of metal stents over surgical palliation in relation to complications [12, 13]. Metal stents have a longer patency than polyethylene stents (median patency 273 days versus 126 days) [14], and usually a single metal stent can palliate obstruction for life [15]. If a metal stent becomes occluded an additional stent may be introduced through the metal stent. However, a recent multi-centre retrospective study has shown that stents inserted following biliary metal stent occlusion showed median second stent patency (metal or polyethylene) of only 75–90 days [16]. Metal stents have been used in patients with benign strictures due to iatrogenic injury [17], radiotherapy [18], fibrous papillary stenosis [7, 11], sclerosing cholangitis [11] and chronic pancreatitis [7, 11], with variable results. Whereas an occluded plastic prosthesis can be exchanged for a new one, an occluded expandable metal stent cannot be removed endoscopically, thus necessitating alternative treatment.

The role of surgical management to treat CBD

Figure 1. *Abdominal CT with contrast showing thrombosis of the main left portal vein with formation of numerous collateral veins around the porta hepatis.*

stricture caused by CP remains controversial. Patients undergoing hepatico-jejunostomy for CP have a 33% postoperative complication rate and an appreciable mortality rate [4, 6], with a 25% late complication rate (at 2 months to 6 years). Further operations are necessary in 13% of cases [19]. Portal hypertension is generally accepted to be a contraindication to operation. Polyethylene stents are frequently used to relieve jaundice in CP [15], but stent occlusion requiring a replacement stent is an inevitable late complication. Median stent patency is 5 months (range 1–56 months) [1]. Only two studies have reported the use of metal stents in the treatment of CBD strictures caused by CP [7, 11]. Deviere *et al.* [7] treated 20 patients with CP using endoscopically placed expandable metal stents. Persistent cholestasis was the indication in all patients, seven of whom had jaundice and three had cholangitis. Eleven patients had been treated previously with plastic endoprostheses. There was resolution of jaundice and cholestasis, with no early complications. Follow-up was for 24–42 (mean 33) months. Eighteen patients had no late complications. Two stents blocked after 3 and 6 months, respectively. Two metal stents were inserted through the blocked stents, but these new stents reoccluded after a further 3 months; plastic stents were then inserted through these metal stents. One of these patients required a hepatico-jejunostomy. Hausegger *et al.* [11] treated seven patients with CP using expandable metal stents. The indication for stent placement was stricture resistance to repeated balloon dilatation. The follow-up interval was 3–55 months. Stents occluded in three patients at 3, 32 and 55 months after placement. Two of these three patients died and the other had a plastic stent inserted through the metal stent. Four stents were patent at 3, 7, 13 and 39 months. Neither paper gives any more information about long-term patency or complications.

The stents in case no. 1 blocked at 12 months and in case no. 2 at 7 months. Initial management was by the introduction of plastic stents through the metal stents. Two years (case no. 1) and 3 months (case no. 2) later after further replacements due to repeated occlusions, placement of new plastic stents through these metal stents was impossible and an internal/external drain had to be used. The use of the metal stents precipitated the need for operation in each patient, as stent occlusion could no longer be relieved endoscopically and episodes of cholangitis were becoming more frequent. Continued replacement by plastic stents was not a viable treatment option. Neither patient was a realistic surgical candidate, yet operation became inevitable because of occlusion of the metal stent. The use of metal stents failed both these patients, one fatally. Furthermore, case no. 1 was treated with a metal stent before any pancreatic surgical referral. Referral was made 3 years later when she was jaundiced and malnourished. Both patients had portal hypertension, and it is possible that this may have induced epithelial hyperplasia to occlude the stent, but we have no evidence to support this suggestion.

The data available on metal stents in the treatment of CBD strictures in CP are restricted to 29 patients (including the 2 patients described here). From this limited experience it seems that management following metal stent occlusion is difficult. In all, 7 of the 29 stents occluded. Of these seven, three underwent major surgical procedures, and two of these patients later died. Two of the four who did not undergo operation were still alive at the time of publication. No long-term data are available (beyond 42 months) on previously reported patent stents. Metal stent placement is recommended in CP by some authors. It is possible, however, that portal hypertension may be a predisposing factor for stent occlusion and this development poses particular problems because these patients are likely to do badly if operation becomes necessary. Polyethylene stent placement should probably be recommended for this group of patients.

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